



**SUBSURFACE  
SCANNING  
SOLUTIONS**

# Subsurface Investigation for Anomalies

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Prepared For: Carlson Environmental

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10/30/2019



October 30, 2019

**Carlson Environmental**

**Attn: Paul Micari**

**Site: 3350 West 131<sup>st</sup> St. Blue Island, IL**

We appreciate the opportunity to provide this report for our work completed on 10/30/19 at the above address in Blue Island, IL.

#### **PURPOSE**

The purpose of this project was to search for any underground anomalies or buried drums remaining on the property. We scanned an 8,000 square foot area along the railroad tracks.

#### **EQUIPMENT**

- **400 MHz GPR Antenna.** The antenna is mounted in a stroller frame which rolls over the surface. The surface needs to be reasonably smooth and unobstructed in order to obtain readable scans. Obstructions such as curbs, landscaping, and vegetation will limit the feasibility of GPR. The data is displayed on a screen and marked in the field in real time. GPR works by sending pulses of energy into a material and recording the strength and the time required for the return of the reflected signal. Reflections are produced when the energy pulses enter into a material with different electrical properties from the material it left. The strength of the reflection is determined by the contrast in signal speed between the two materials. The total depth achieved can be as much as 8' or more with this antenna but can vary widely depending on the conductivity of the materials. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors. For more information, please visit: [Link](#)
- **GPS.** This handheld GPS unit offers accuracy down to 4 inches, however, the accuracy will depend on the satellite environment and obstructions and should not be considered to be survey-grade. Features can be collected as points, lines, or areas and then exported into Google Earth or overlaid on a CAD drawing. For more information, please visit: [Link](#)

#### **PROCESS**

Initial GPR scans were collected in order to evaluate the data and calibrate the equipment. Based on these findings, a scanning strategy is formed, typically consisting of scanning the entire area in a grid with 3'-5' scan spacing in order to locate any potential anomalies that may remain at the site. The GPR data is interpreted in real time and anomalies in the data are located and marked on the surface along with their depths using spray paint, pin flags, etc. Depths are dependent on the dielectric of the materials being scanned so depth accuracy can vary throughout a site. Relevant scan examples were saved and will be provided in this report.

### **LIMITATIONS**

Please keep in mind that there are limitations to any subsurface investigation. The equipment may not achieve maximum effectiveness due to soil conditions, above ground obstructions, reinforced concrete, and a variety of other factors. No subsurface investigation or equipment can provide a complete image of what lies below. Our results should always be used in conjunction with as many methods as possible including consulting existing plans and drawings, exploratory excavation or potholing, visual inspection of above ground features, and utilization of services such as One Call/811.

At this site, our scans were limited by snow/water on the ground, the sides of fences, and debris/trees/bushes in the area. Our underground antenna cannot scan within 3ft of any surface obstructions. The obstructions can be seen in photos on page 4.

### **FINDINGS**

We found that the soil allowed for maximum GPR depth penetration of 5' in most areas. GPRS did not locate any utilities while onsite.

The areas were scanned as best as possible and based upon the data we were able to locate 3 anomalies consistent with that of a possible buried drum, or unknown anomalies in the scan areas. Further investigation may be required.

It should not be assumed that everything was able to be located in the scan areas. GPRS located what we were able to locate given site conditions/obstructions, scanning constraints and equipment limitations.

The following pages will provide photos and further explanation of our findings.



<p>Scan Area Outlined in Blue</p>		<p>3350 West 131<sup>st</sup> St. Blue Island, IL</p>	
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Site Map with Findings  
Pink = Unknown Anomaly

3350 West 131<sup>st</sup> St.  
Blue Island, IL



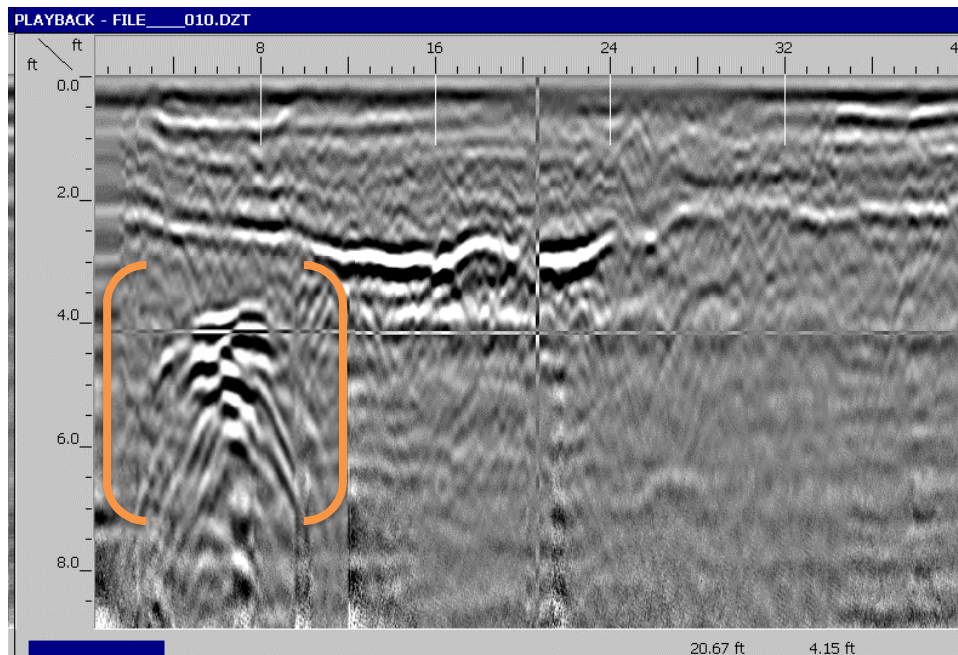




GPR Data Screenshots and Photos

3350 West 131<sup>st</sup> St.  
Blue Island, IL





GPR data screenshot of the unknown anomaly. The depth scale is on the left and the distance of the scan is across the top, forming a cross section view of the subsurface. The orange brackets are showing the anomaly that was found in the area.



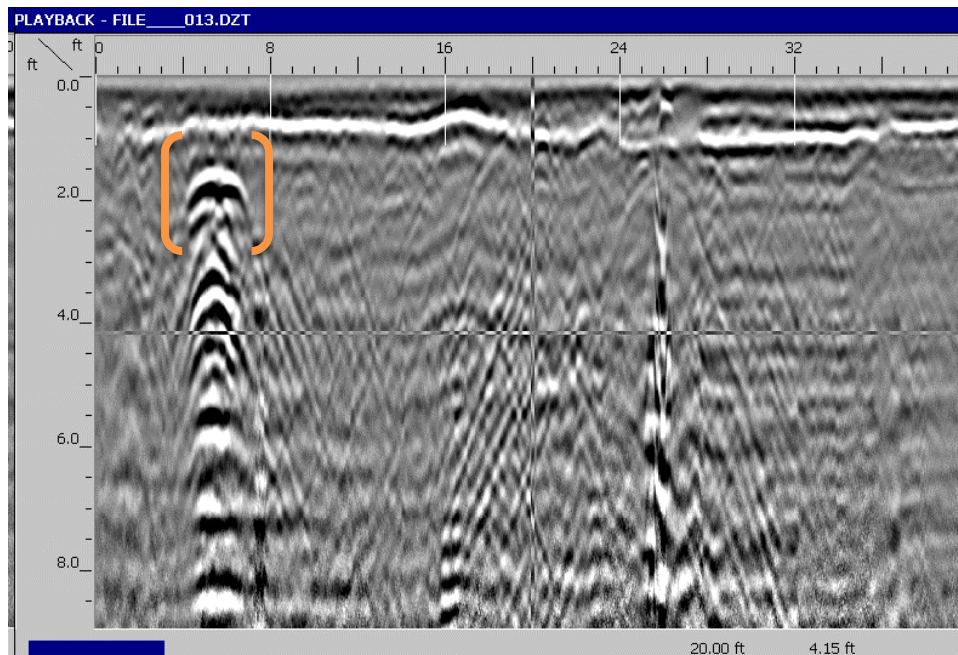
Photo of the unknown anomaly

GPR Data Screenshots and Photos

3350 West 131<sup>st</sup> St.  
Blue Island, IL







GPR data screenshot of the unknown anomaly. The orange brackets are showing the anomaly that was found in the area.



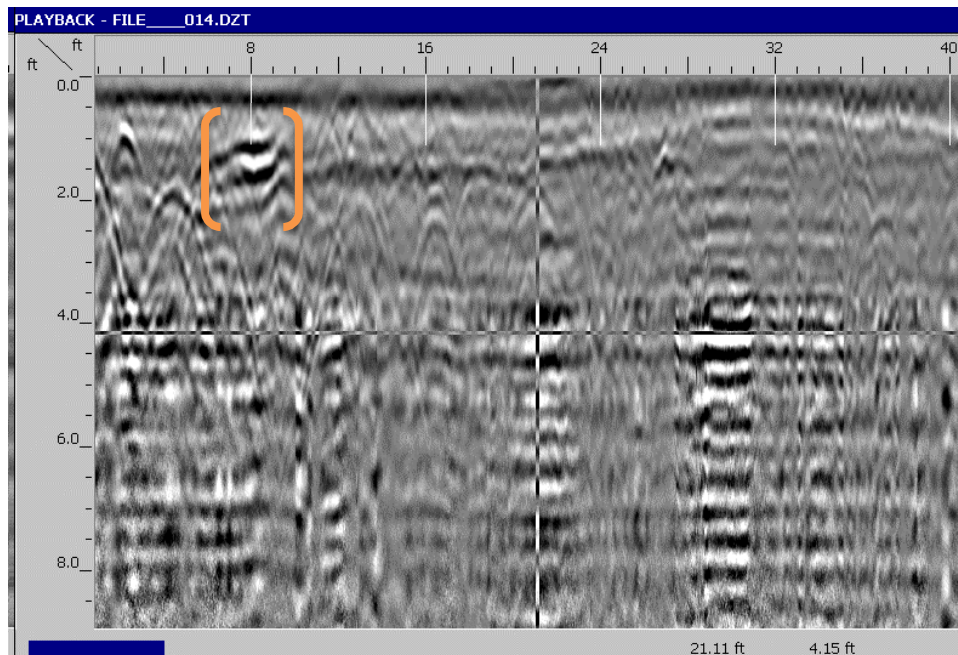
Photo of the unknown anomaly

GPR Data Screenshots and Photos

3350 West 131<sup>st</sup> St.  
Blue Island, IL







GPR data screenshot of the unknown anomaly. The orange brackets are showing the anomaly that was found in the area.

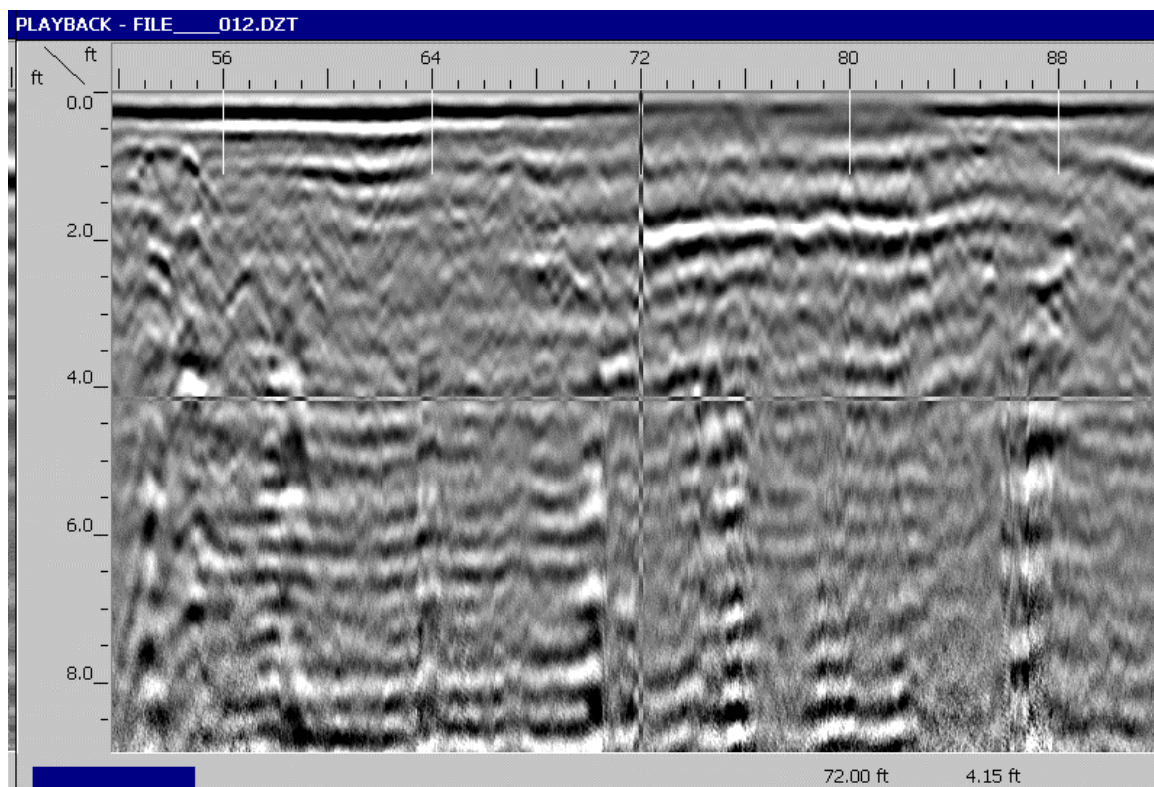


Photo of the unknown anomaly

GPR Data Screenshots and Photos

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Typical GPR Data Screenshot from the scan area

3350 West 131<sup>st</sup> St.  
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